DOCUMENT RESUME

ED 171 189 HE 011 209

TITLE An Analysis of the Tuition Advance Fund Bill.
INSTITUTION Data Resources, Inc., Lexington, Mass.; National Association of Independent Colleges and Universities, Washington, D.C. National Inst. of Independent Colleges and Universities.
PUB DATE 29 Sep 78
NOTE 50p.; Not available in paper copy due to marginal legibility of the original document; For related document see HE 011 208
AVAILABLE FROM National Institute of Independent Colleges and Universities, Suite 503, 1717 Massachusetts Avenue, N.W., Washington, DC 20036

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS College Students; Educational Finance; *Educational Legislation; Federal Legislation; *Financial Support; Higher Education; *Loan Repayment; Mathematical Formulas; Private Colleges; Socioeconomic Status; State Colleges; *Student Financial Aid; *Student Loan Programs; Student Responsibility; *Tuition
IDENTIFIERS Legal Analysis; *Tuition Advance Fund

ABSTRACT

The Tuition Advance Fund (TAF) bill is analyzed on theoretical economic grounds, and forecasts of the net costs of the proposed program up to 1990 are offered. The TAF bill proposes the establishment of a new system of college loans as an addition to existing programs to allow students to borrow tuition plus an allowance for other costs. Novel ideas in the bill include treatment of loan payments as tax obligations and pooling of income of married couples with loans for the purpose of calculating taxable income. Projected deficits are larger than the maximum appropriation in the early years of the program whether or not tuition controls are included. It is demonstrated that loans in the program are cheaper for students at private colleges than for public college students. Further, although private college enrollments are expected to be only 20 percent of the total in the 1979-80 school year, students in the private colleges are projected to take 37 percent of the loan money from this program. Both effects are due to the relatively high tuition charges in private colleges. Comparative statistics are provided along with an addendum to the bill prepared by Data Resources, Inc. (SW)

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AN ANALYSIS OF THE TUITION ADVANCE FUND BILL

by

Data Resources, Inc.
29 Hartwell Ave.
Lexington, MA 02173

September 29, 1978

I. INTRODUCTION

The Tuition Advance Fund bill proposes the establishment of a new system of college loans as an addition to existing programs. The system, financed by a $4.5 billion, inflation-indexed yearly appropriation, would allow students to borrow tuition plus an allowance for other costs, subject to an overall ceiling of $5,000 (indexed) per year. After graduation, participants would pay a 2% tax on income until 150% of the loan was repaid. Eligible colleges would be required to tie tuition increases to the Consumer Price Index and follow restrictions on enrollment increases.

This study focuses on the bill from two perspectives

- An analysis of the bill on theoretical economic grounds
- A forecast of the net costs of the proposed program up to the year 1990.

The economic analysis uncovers some novel ideas in the bill

- Treatment of loan payments as tax obligations
- Pooling of income of married couples with loans for the purpose of calculating taxable income.

It also highlights some potential problems with the form of the program, for instance

- The payment provisions make effective interest rates on loans lower for persons with low incomes and/or large loans.
- Tuition and enrollment controls proposed by the bill could cause widespread disruptions in the higher education system.

Forecasts of net costs of the program assume participation rates of one-fourth, one-half and one and assume that students who participate in the program borrow either half or all of the maximum available to them. Perhaps the most likely alternative assumes that half the eligible students participate and that each participant borrows as much as possible. With these values, the projected nominal, yearly deficits for the program are shown in Table 1. Therefore, with these assumptions about participation and the amount borrowed, projected deficits are larger than the maximum appropriation in the early years of the program whether or not tuition controls are included. Projected real deficits fall over the 1980-1990 period with or without tuition controls.

Section IV demonstrates that loans in this program are cheaper for students at private colleges than for public college students. Further, although private college enrollments are expected to be only 20% of the total in the 1979-1980 school year, students in the private colleges are projected to take 37% of the loan money from this program. Both effects are due to the relatively high tuition charges in private colleges.

TABLE 1

Forecasts of Net Program Costs With Half the Eligible Students Participating and With Each Participant Borrowing as Much as Possible

	Maximum Allowable Annual Appropriation (in billions) (Indexed for DRI's Forecast of Inflation)	Forecasts of Net Costs of Tuition Advance Fund (in billions)	
		Tuition Controls	No Tuition Controls
1980	4.5	6.1	6.1
1981	4.8	6.3	6.4
1982	5.2	6.6	6.8
1983	5.6	6.9	7.1
1984	6.0	6.9	7.2
1985	6.5	6.8	7.2
1986	7.1	6.7	7.3
1987	7.8	6.7	7.5
1988	8.3	6.4	7.2
1989	8.9	5.8	6.8
1990	9.5	5.2	6.4

II. SUMMARY OF THE TUITION ADVANCE FUND BILL

The Tuition Advance Fund Bill, HR 12268 (95th) establishes a new system of tuition advances for students who have completed at least one year of college, are under 35 years of age, and are attending an eligible institution at least half-time. Undergraduate students may borrow the full amount of tuition plus up to $1000 (not indexed for inflation) for education-related costs, subject to an overall maximum of $5,000 per year or $15,000 total (both indexed for inflation).

Each borrower incurs an obligation of 150% of his total loan, repaid by a tax of 2% on his "includable" adjusted gross income in each year commencing one year from the end of school until the obligation is discharged or the borrower reaches age 65. For married persons who both have loan obligations or for which one-half their combined income exceeds an individual borrower's own income, includable adjusted gross income is defined as one-half their combined income. No payment is due in any year during which a borrower's includable adjusted gross income is less than $5,000 (not indexed for inflation).

In order to be eligible for the program, colleges must not have increased their enrollment more than 2% a year or 10% in total since the bill was enacted. Further, such colleges may not increase tuition faster than the inflation rate defined by the Consumer Price Index (CPI), except that public colleges are allowed an additional 10% increase in tuition.

The act establishes a trust fund to finance the program with yearly appropriations not exceeding $4.5 billion (adjusted for inflation). Appropriations cease two years after the fund's first break-even year, if such a year occurs. The new program is simply added to existing loan and grant programs, none of which are deauthorized by the bill.

III. AN ECONOMIC ANALYSIS OF THE TUITION ADVANCE FUND BILL

A. Advantages of the Proposed Program

The principle innovation in this bill is treatment of payment obligations as tax liabilities. This treatment would insure that the obligations cannot be released through a declaration of personal bankruptcy. Since learning cannot be repossesed on default, this treatment is economically sound.

Since default is precluded, it is appropriate that the bill limit the obligational burden by making payments income-contingent and by providing a threshold below which no payments are due. (However, this threshold should be indexed).

Another useful innovation is the pooling of income of spouses when this pooling results in a higher includable adjusted gross income. This idea is sensible since there are many chances to substitute the time of one spouse for that of the other. Without such pooling, couples with only one loan would be faced with a higher income tax on the indebted spouse, inducing substitution within the home. For instance, wives who have loan obligations and would otherwise have worked part-time while raising children might decide to take over some home duties so their husbands can work more.

B. Problems

The most serious economic problem with this bill is its method of computing implicit interest charges on college loans. Any income tax will tend to induce people to work less, and the low 2% rate acts to spread the burden of payments and decrease the work disincentives in each year. It also pushes payments far into the future, an appropriate idea since earnings typically increase over the lifetime. However, the stipulated payment procedure leads to some unusual and perhaps unintended incentives, since the effective cost of additional loans is smaller the smaller is expected income and the larger is the amount already owed to the fund.

To understand this problem it is instructive to consider the case of students who earn a constant (nominal) amount in all years after graduation and who are, for example, 23 years old when they begin making payments. (This results in their making no more than 43 payments in total). Table 2 shows repayment obligations and effective interest rates paid at various income and loan levels under these assumptions.

Table 2

Repayment Obligations and Effective Interest Rates for Borrowers With Constant Nominal Incomes

	$1,000 Loan	$15,000 Loan
$4,999 Income		
Yearly Payment	$0	$0
Years	Not Meaningful	Not Meaningful
Total Payments	$0	$0
Effective Interest Rate		
$10,000 Income		
Yearly Payment	$200	$200
Years	7.5	43
Total Payments	$1,500	$8,600
Effective Interest Rate	11%	-2%
$50,000 Income		
Yearly Payment	$1,000	$1,000
Years	1.5	22.5
Total Payment	$1,500	$22,500
Effective Interest Rate	37%	4%

The effective interest rate on loans gets smaller as income decreases or loan size increases. At small enough incomes or large enough total liabilities, effective interest rates are negative (i.e., total payments are smaller than the loan). Beyond this point all incremental loans are free and are really grants. All loans are free to students who never receive an income above $5,000. Loans above $5,733 (= 43 x 2000/1.5) are free to persons whose income is always $10,000.

Clearly, actual incomes will rise over time because of inflation if not because of career advances. However, the general principles shown in Table 1 remain valid with rising incomes. Larger loans are more heavily subsidized than smaller loans, and persons with low incomes still get loans very inexpensively. As a result, loans will be most attractive to students whose areas of concentration have a low economic payoff over their lifetimes (e.g., humanities rather than engineering). Further, most students who take out a loan under this program will have a strong incentive to borrow as much as they can.

The problem of perverse incentives could be lessened by making the rate of tax for paying loans larger for larger loans and smaller for larger incomes.* If this were done, it would be desirable to put a ceiling on the rate of payment in any year (say 5 or 10% of includable adjusted gross income) to keep payment burdens and work disincentives manageable.

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* Note that payments that are independent of income, the usual case, are a much smaller fraction of large than of small incomes.

In addition to making payments dependent on loan size and income, they could also be made dependent on the age at which the person first begins repaying his debt. If payments were sufficiently high for older borrowers, these persons could pay back even large loans. Therefore, it would not be necessary to exclude students over 35 years old from the loan program.

As presently constituted, the implicit subsidies involved in this program may be large, so schools might be less cost-conscious if this bill were enacted. This fear presumably lies behind the clauses limiting increases in enrollment and tuition for eligible institutions. An alternative course of action would be to decrease the implicit subsidy and remove these controls. If the decrease in subsidy caused some institutions not to be able to compete, they could be given specific, institutional aid.

Enrollment restrictions will cause problems for any institution that would otherwise have grown faster than the ceilings — schools in the sun belt, perhaps, or schools whose local popularity is increasing. Students who would have attended these schools will have to go elsewhere or the school will become ineligible for loans.

Limiting tuition increases to increases in the CPI will also cause problems. Colleges are inherently very labor-intensive. Only 8% of current expenditures by colleges in 1974-1975 were for plant operation and maintenance. (Digest of Education Statistics, 1976). This labor-intensity makes it difficult to achieve any substantial technological change and implies that tuition-related costs will tend to increase with wage costs, rather than with consumer prices. Thus the national average of total labor costs per hour rose at a 7.4% compound, annual rate between 1966 and 1976, while average tuition rose at a 7.4% rate at private colleges, 7.2% at public colleges. By comparison, the CPI rose at only a 5.8% rate during this period.*

Regional differences can also lead to problems with tuition controls in those states with relatively rapid increases in wage rates. Therefore, if controls on tuition are desired, a reasonable alternative course would be to tie tuition increases to a local or regional wage index. An index of wages in manufacturing is published by the Bureau of Labor Statistics in Wages and Hours by State in Manufacturing. If this index were used for tuition controls it should probably be adjusted for industry mix and for the importance of manufacturing in each state.

It is interesting to consider the effects of inflation on program costs. As with any fixed-payment loan, inflation diminishes the value of payments. As the bill is written, however, inflation erodes the $5,000 nominal threshold and, if earnings also rise, increases the taxable base. Both effects speed payments and make it more likely that the full loan will be paid back. These effects will help offset the decrease in the value of payments. The erosion of the $5,000 threshold may not be desirable, since the protection it provides to the borrower will decrease rapidly in inflationary times.

Finally, the loans from this program may not be particularly popular with students and financial aid officers if, as the bill is currently written, all other loan programs

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* College costs are taken from the Digest of Education Statistics, 1976. The wage and price indices are U.S. Bureau of Labor Statistics series.

continue in their present form. Except for students who expect to earn very low incomes, the contrast between an option to default in the other programs and the impossibility of default in this program may prove decisive. Similarly, schools may decide not to abide by the enrollment and tuition restrictions in the bill if alternate sources of loans are available for their students.

Two possible alternatives:

1. Institute a Tuition Advance Fund in place of existing programs or
2. Simply use some of the bill's innovative ideas to modify existing programs.

As an example of the second alternative, treatment of loan payments as income-contingent tax obligations with pooling of spouses' incomes could be reserved for students who default on future loans made under existing programs. Since conversion to a contingent federal obligation effectively precludes default, such a plan could be set up so that most loans would remain non-contingent, private obligations. Disincentives for work would then apply only to the relatively few borrowers who default. Also, the income-contingent provision would protect defaulting borrowers against overly burdensome payment obligations in any one year. As with the income-contingent clauses of the existing bill, this idea could be instituted with payments that depend on income, size of outstanding debt to the government, and age at first payment.

C. Summary

The Tuition Advance Fund bill presents a number of useful ideas for modifying the system of loans to college students. Treatment of repayments as income-contingent tax obligations and pooling of spouses' taxable income are sensible innovations, although they could be reserved for students defaulting on new loans from existing programs.

The proposal contains some potential problems:

1. The bill's payment provisions make effective interest rates paid by a borrower highly dependent on his income and on how much he owes to the program.
2. The bill's restraints on enrollment and tuition increases can be expected to cause major problems for colleges.
3. The fixed payments coupled with variable costs make the program susceptible to the effects of inflation. The bill's failure to index the threshold below which no payments are due means that inflation will erode the protection afforded by this threshold.
4. The program faces uncertain acceptance if it is enacted with existing programs still in place. Students may prefer loan programs where default is possible, and colleges are likely to prefer programs that do not contain enrollment and tuition controls.

IV. FORECASTS OF NET COSTS OF THE TUITION ADVANCE FUND BILL

In order to forecast the implications of enactment of the Tuition Advance Fund Bill it is necessary to make a number of simplifying assumptions. They are:

1. An amended version of the Tuition Advance Fund Bill (indexing the $1,000 "other education costs" limit and the $5,000 income threshold)* is enacted this year (1978) and all U.S. colleges became eligible for loan funds for the 1979-1980 school year. For convenience, 1979-1980 is denoted 1980 herein, so income and price data for 1980 are applied to school data for 1979-1980. This convention is used because more months of any school year fall in its spring year than in its autumn year and because it matches each school year with the appropriate federal fiscal year.

2. Thirty-four percent of all college students are freshmen, 22% in each other class. This assumption is approximately correct, depending on the type of school. It adjusts for the exclusion of freshmen from loan availability.

3. All students taking loans complete exactly four years of college and all are under 25 years old when they enter repayment status. Again, these assumptions are approximate. Some students complete more than four years, some less, but four years seems a reasonable compromise level for people who have attended the second or higher year of college.

4. All borrowers remain single while in repayment status.

5. Participation rates and the proportion of the limit borrowed are constant over time.

6. Borrowers for the program are a random sample of all college students of their age and sex. Also, the income distributions and fraction in the population of all students who have attended the second or higher year of college will continue to bear the same relationship to the corresponding values for all persons of their sex as the values for 25-34 year old college attendees did to all persons 25-34 in 1976. Persons are assumed to be distributed evenly across ages within age groups.

7. All borrowers whose incomes are large enough continue to make loan payments up to and including 1990. In particular, no participant completes payment on his loan before 1990.

8. For part-time college students, costs are assumed to bear the same relationship to full-time costs as does attendance (e.g., half-time students have costs half as large as full-time students). All college students beyond the first year are assumed to attend school at least half time and, therefore, to be eligible for loans in the program.

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* These changes were requested by AMICUS.

These rather strong assumptions are necessary to keep the analysis manageable. The effects of possible biases introduced by the assumptions are discussed below and used to interpret the numerical results.

Given these assumptions, the cost of the program in any year, t, up to 1990 is given by

$$\text{COST}_t = (.66)\ (\text{Participation Rate})_t \times (\text{Proportion of limit borrowed})_t \times \Big[(\text{Public Cost limit})_t \times (\text{Full-time-equivalent public college enrollment})_t + (\text{Private Cost limit})_t \times (\text{Full-time-equivalent private college enrollement})_t \Big]$$

where t starts at 1 in 1980.

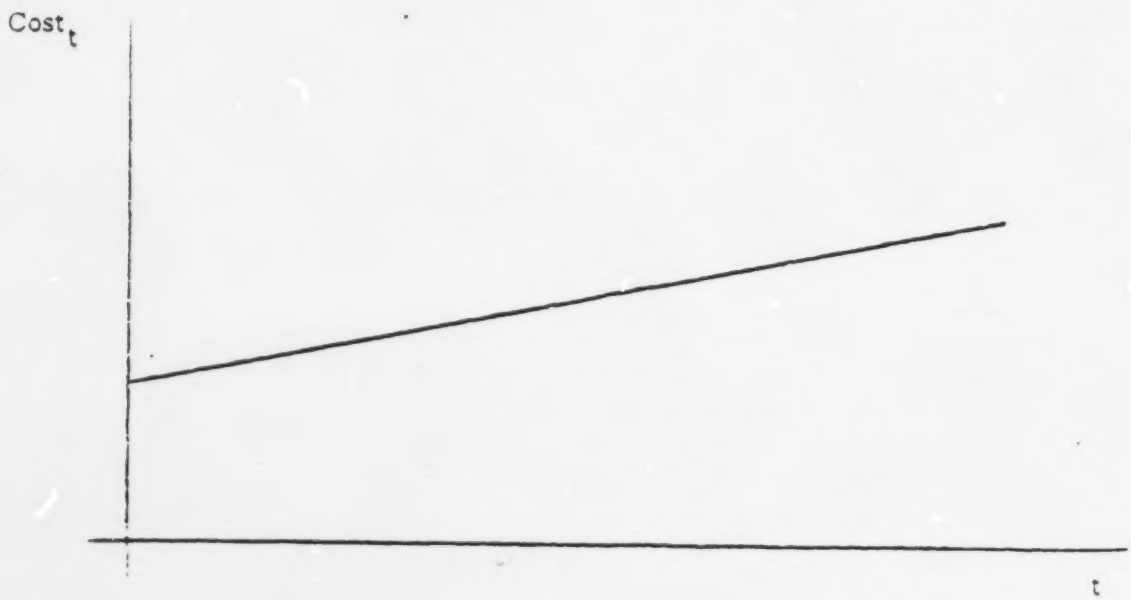
The return to the program is given by

$$\text{RETURN}_t = (.02) \times \Big[(\text{Aggregate includable income earned by men})_t + (\text{Aggregate includable income earned by women})_t \Big] \times (\text{Participation Rate})_t \times (t-1)/10,$$

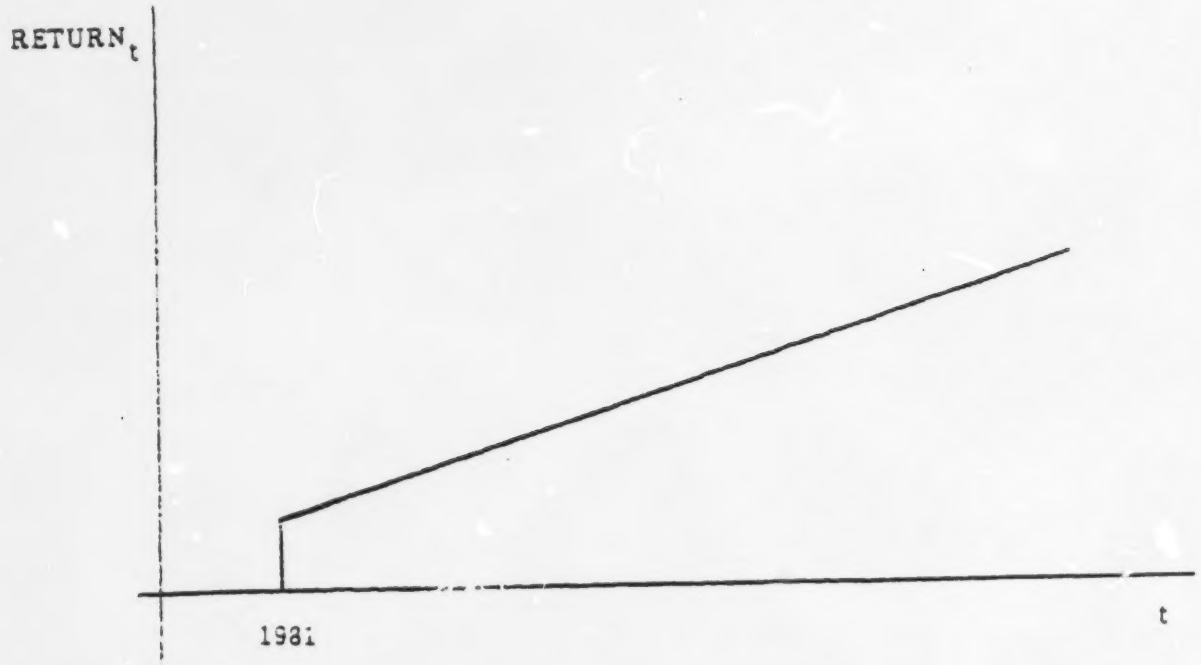
where the aggregate includable incomes are the aggregate income earned by 25-34 year old, eligible persons who earn more than the threshold value ($5,000 in 1980). The last term captures entry of successive groups of students into payment status. The age span 25-34 covers ten years, so this term is zero in 1980, one tenth in 1981, etc. up to one in 1990.

The net cost of the program in year t is simply $\text{COST}_t - \text{RETURN}_t$

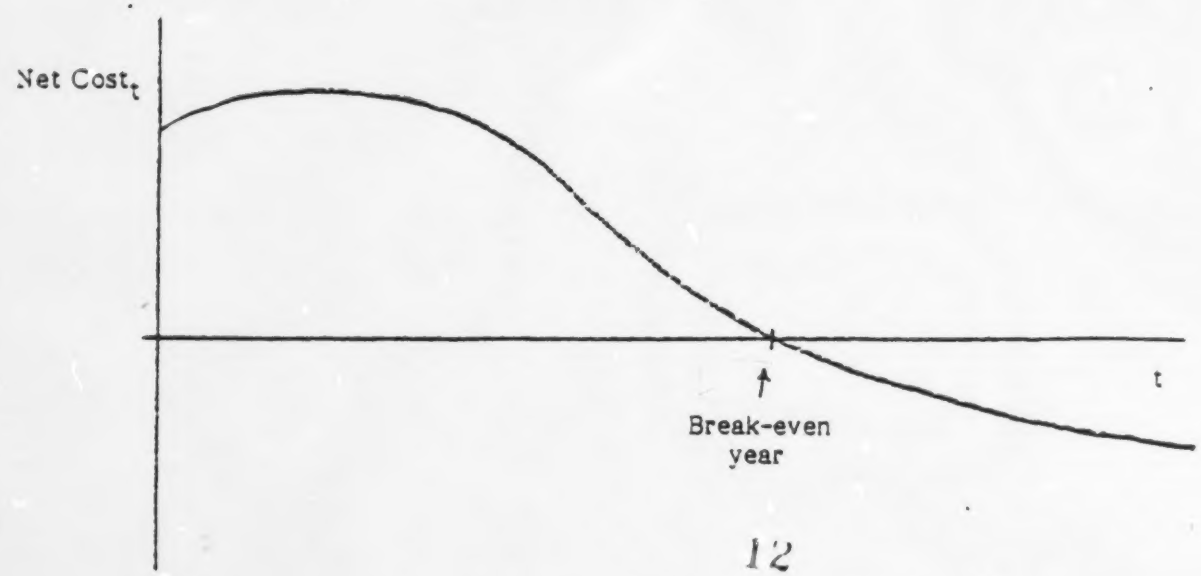
Graphically, COST_t will increase with enrollment and inflation, as



$RETURN_t$ will increase with inflation, productivity increase, and entry of new borrowers into payment status, as



and net cost may increase at first but will probably decrease eventually and cross zero, as



12

The break-even year comes where $COST_t = RETURN_t$. Since the participation rate multiplies both costs and returns, increases in participation will increase both the deficit in early years and the surplus in later years without affecting the break-even year. The proportion of the limit borrowed only enters costs, so increases in it will increase both the deficit and the number of years until the program breaks even. Increased productivity growth will only affect returns, decreasing the number of years until the program breaks even. Finally, if college costs were not indexed or were tied to a wage index, costs would rise more rapidly and it is possible that the program might never break even (since increases in the general wage level would raise both costs and returns and persons completing payments could be balanced by new persons entering payment status).

This simple model of the aggregate effects of the loan program provides a framework for examining possible biases in the estimates of those effects caused by assumptions 1 through 8.

Most borrowers will marry but, so long as 25-34 year old college-educated males and females marry each other, the aggregate estimated net cost of the program will be only slightly biased. Since "includable" income is the larger of own income and half of joint income for those couples with one loan obligation, the assumption that borrowers remain single will bias estimates of $RETURN_t$ slightly downward if few people participate in the program.

Any sharp changes in the participation rate or the proportion of the limit borrowed (due, say, to deauthorization of an existing loan program or to a recession) will have obvious effects on the net cost of the program.

The payment structure will probably lead to self-selection of borrowers toward lower-than-average expected incomes and higher-than-average college costs if program participation is low. Also, some borrowers will stop making payments before 1990, because they will have paid off their loans, expatriated, or found a successful method of evading taxes.

Half-time students will probably bear more than half the costs of full-time students, but some part-time students will attend school less than half time and be ineligible for the program. Therefore, costs estimated by multiplying full-time costs by full-time-equivalent enrollment will contain biases in both directions.

The upward bias due to including ineligible students is probably the larger of the two, implying a net upward bias on costs. Returns are also biased upward on this account, however, since they are calculated as 2% of the aggregate includable income of all persons who attended the second or higher year of college, whether they attended college full or part time. The upward and downward biases on net program costs due to including ineligible persons should roughly cancel out after a few years, since years of college completed is the functional analogue for returns of full-time-equivalent attendance for computing costs. In the early years of the program, however, when returns are small, inclusion of ineligible students probably biases net costs upward. Unfortunately, the necessary data to relax this assumption —distributions of the hours of training by current part-time students and breakdowns of the earlier college experience of persons 25-34 years old into full and part-time— are not available.

The net effect of these biases on estimated net costs could go either way since there are biases in both directions. At low levels of participation, the moderate effect of the no-marriage assumption will probably be offset by the assumptions of

no self selection and that all persons pay until 1990. At higher levels of participation, these biases will be small and may be overcome by any net bias from including ineligible students. For the early years of the program, at least, this bias will likely be upward, so high participation rate, early year deficits are probably overestimated. The most likely candidates for underestimation are the late years of low-participation-rate or low-proportion-of-limit net costs, since for these ranges the assumption that all borrowers pay until 1990 is likely to be violated.

Table 3 presents DRI's forecast distributions of the Census Money Income of college-educated men and women.* The thresholds in 1980 equal $5,000 plus the average unemployment compensation and welfare income of persons earning $4,500-$5,500 of other types of income. Thresholds in later years are the 1980 value times the (CPI-based) price index divided by 100. Adjustments for welfare and unemployment compensation are used to reconcile DRI's forecasts of Census Money Income with the bill's use of adjusted gross income, since welfare and unemployment compensation are not taxable.

Both inflation and productivity growth are forecast to continue in the 1980's. Aggregate amounts earned by women will be less than those earned by men because, despite recent gains, fewer women than men are expected to attend college and they will continue to earn less than men.

Table 4 contains projections of full-time undergraduate costs and full-time-equivalent undergraduate enrollments. For the years 1980 to 1986, enrollments and real costs are taken from Projections of Education Statistics to 1985-1986 (National Center for Education Statistics, 1977). Since full-time-equivalent enrollments reported in that source include graduate school enrollment, these were reduced separately for public and private schools by the fraction that projected graduate enrollments bear to projected total enrollments. Nominal costs were created from real costs using the CPI. Values for 1987 to 1990 were created by projecting the components of the projections for four additional years before combining them.

Tuition costs are pegged to the CPI in the bill. Therefore, values for the public limit are simply the average 1980 tuition plus $1,000, times the price index in Table 3, divided by 100. The private college limit was adjusted to account for tuition changes above $4,000 (and, therefore, "other education costs" allowances less than $1,000). Figures supplied to Boston University by the Academic College Testing Program showed that, in 1977, 123,000 students attended schools with tuition charges of $4,000 or more. For Table 4, DRI assumed that 20% of all private

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* Census Money Income (CMI) is the sum of all income from the following sources: money wages and salaries, net income from farm or nonfarm self employment, Social Security or railroad retirement, supplemental Social Security Income, welfare, interest, dividends, income from estates or trusts, net rental income, veterans' payments, unemployment or workmen's compensation, pensions, and alimony or other periodic income. CMI does not include capital gains or imputed non-money income. To get these forecast values, DRI used the 1976 Current Population Survey Annual Demographic File to compute (separately for each age-sex group) ratios of the CMI distributions of persons who had attended the second or higher year of college to CMI distributions of all persons. These ratios were then applied to DRI's forecasts of the CMI distributions of all males and females.

TABLE 3

Characteristics of Forecast Income Distributions for 25-34 Year Old Men and Women Who Have Attended The Second or Higher Year of College

MEN

	Price Index	Threshold	Number (000)	Number With Income (000)	Number Over Threshold (000)	Mean Income ($)	Mean Real Income ($)	Aggregate Income Of Those Above Threshold ($ Million)
1980	100	5,600	7,907	7,856	7,348	21,794	21,794	169,935
1981	107	5,991	8,189	8,138	7,656	24,254	22,673	196,077
1982	116	6,489	8,276	8,225	7,723	26,660	23,009	217,360
1983	125	7,007	8,426	8,378	7,772	28,557	22,822	237,546
1984	134	7,488	8,572	8,528	7,954	31,519	23,573	267,055
1985	144	8,055	8,717	8,674	8,155	35,261	24,515	304,100
1986	158	8,836	8,845	8,803	8,233	38,968	24,699	341,084
1987	172	9,639	8,935	8,895	8,191	40,850	23,685	360,879
1988	185	10,344	8,991	8,953	8,269	45,351	24,553	403,509
1989	197	11,050	9,015	8,979	8,337	50,542	25,615	451,308
1990	212	11,864	8,984	8,949	8,333	55,975	26,422	498,417

WOMEN

	Price Index	Threshold	Number (000)	Number With Income (000)	Number Over Threshold (000)	Mean Income ($)	Mean Real Income ($)	Aggregate Income Of Those Above Threshold ($ Million)
1980	100	5,141	5,446	4,972	3,810	11,019	11,019	52,493
1981	107	5,500	5,691	5,221	4,040	12,130	11,339	60,891
1982	116	5,957	5,792	5,333	4,147	13,377	11,545	68,715
1983	125	6,433	5,946	5,501	4,238	14,490	11,580	76,601
1984	134	6,874	6,094	5,660	4,373	15,814	11,827	86,151
1985	144	7,395	6,237	5,812	4,535	17,494	12,163	98,194
1986	158	8,111	6,367	5,952	4,632	19,384	12,286	111,390
1987	172	8,867	6,471	6,067	4,671	20,940	12,141	122,212
1988	185	9,496	6,548	6,157	4,755	22,932	12,415	136,039
1989	197	10,144	6,599	6,222	4,830	24,191	12,767	151,372
1990	212	10,891	6,615	6,253	4,869	27,693	13,072	167,493

TABLE 4

Projected Full-Time Undergraduate Costs and
Full-Time-Equivalent Enrollments in Institutions of Higher Education

	Full-Time Equivalent Enrollment			Tuition		
	Total	Private	Public	Average	Private	Public
1980	8,450	1,692	6,758	1,205	3,220	701
1981	8,599	1,684	6,915	1,302	3,514	763
1982	8,723	1,671	7,052	1,424	3,880	842
1983	8,779	1,650	7,129	1,554	4,271	925
1984	8,743	1,614	7,128	1,678	4,650	1,005
1985	8,632	1,568	7,064	1,825	5,096	1,099
1986	8,489	1,520	6,968	2,026	5,690	1,226
1987	8,358	1,477	6,881	2,240	6,331	1,362
1988	8,231	1,449	6,782	2,436	6,898	1,482
1989	8,104	1,423	6,681	2,642	7,496	1,608
1990	7,978	1,394	6,548	2,877	8,183	1,754

	Room and Board			Limit of Private College Costs	Limit of Public College Costs
	Average	Private	Public		
1980	1,626	1,686	1,611	4,120	1,701
1981	1,769	1,805	1,760	4,407	1,820
1982	1,932	1,958	1,926	4,774	1,971
1983	2,105	2,116	2,102	5,155	2,128
1984	2,267	2,263	2,268	5,509	2,274
1985	2,461	2,438	2,466	5,926	2,447
1986	2,721	2,677	2,731	6,501	2,684
1987	3,024	2,930	3,044	7,106	2,934
1988	3,266	3,140	3,293	7,610	3,142
1989	3,519	3,360	3,553	8,129	3,356
1990	3,810	3,613	3,852	8,729	3,603

colleges would charge more than $4,000 in 1980 and that the average charge by these schools would be $4,500. Therefore, the 1980 private limit is tuition plus $900, (.8 x 100) + (.2 x 500), subsequent-year values adjust that amount for inflation.

Table 5 contains estimated loan obligations and effective interest rates for typical single male and typical single female borrowers taking maximum loans in various situations. For this table, DRI projected the mean incomes of men and women out to the year 2010 (these income projections are presented in the Appendix). The reader is cautioned that values beyond 1990 are merely projections to facilitate calculation of the numbers in Table 5. They are not forecasts.

Due to their higher incomes, loans are always more expensive for single males than for single females. Loans to students attending private colleges are larger and, therefore, cheaper than those to persons attending public colleges. The maximum loan is $5,000 borrowed in 1980 plus $5,349 in 1981 plus $5,793 in 1982. The results in Table 5 imply that loans will be most attractive to students attending private colleges, particularly for those with tuition below $4,000 or low expected incomes.

TABLE 5

Estimated Repayment Obligations and Effective Interest Rates
For Typical Single Male and Female Borrowers

	Male		Female
Three Years Private College			
Size of Loan		$11,416	
Years of Payments	14		21
Last Payment Year	1996		2003
Effective Interest Rate	4%		3%
Three Years Public College			
Size of Loan		$ 5,010	
Years of Payments	10		14
Last Payment Year	1992		1996
Effective Interest Rate	6%		4%
Three Years Maximum Loan			
Size of Loan		$16,142	
Years of Payments	15		23
Last Payment Year	1997		2005
Effective Interest Rate	4%		3%
One Year Public College			
Size of Loan		$ 1,057	
Years of Payments	5		8
Last Payment Year	1985		1988
Effective Interest Rate	15%		9%

The high effective rates paid by persons who attend one year of public higher education reflect the options of seniors in the fall of 1979. Given these results, it is unlikely that many seniors will avail themselves of loans. Results for one year of public college are not directly applicable to students who take junior college and then discontinue their education. Persons who stop after junior college will presumably earn less than the average college attendee and, therefore, pay moderately lower rates. Still, these results imply that loans under the program are unlikely to be popular with students who intend to stop after junior college.

The rates shown in Table 5 would be higher if they were not computed under the assumption that all students borrow as much as possible. For instance, since $1,057 is 21% of $5,010, persons attending a public college for three years and borrowing only 21% of their allowable amount will pay slightly less (because payments are made later) than the rates for those attending one year of public college. Therefore, it is likely that most students who participate in the program will take as large a loan as they can.

Table 6 presents estimates of the costs of the program by type of school, its returns and its net costs at various levels of participation and proportion of limit borrowed under assumptions 1 through 8. The first column shows the appropriation limit — $4.5 billion adjusted for inflation. The second column gives the critical value of the proportion of limit borrowed at which (for any participation rate) the net costs of the program would be zero in that year. This proportion rises from zero in the first year to more than one-half in 1990. (As it must, since net costs become negative in 1990 for all participation rates if half the limit is borrowed).

Even with the assumption of no self-selection by college cost, the higher tuition rates charged by private colleges make them the major beneficiaries of this program. In 1980, private colleges are projected to have only 20% of total full-time-equivalent enrollments, but their students will receive 37% of the loan money from this program.

Net costs of the program are highly dependent on the level of participation and the percent of the limit borrowed. If participating students borrow only half of the available limit, the program is projected to break even by 1990. If, in addition, only 25% of the eligible students avail themselves of loans, the program will never cost more than $1.6 billion. Conversely, if all eligible students borrow the maximum available, the program will cost $12.2 billion in 1980, rising to $14.6 billion in 1986.

The analysis presented above implies that most program participants will borrow up to their limit, while the availability of existing loan and scholarship programs, parents, and savings makes it unlikely that all eligible students will participate. Therefore, the most likely projections are those with participation rates equal to one-half or one-fourth and proportion of limit borrowed equal to one. Between these choices, the program is projected to stay within its appropriation limit if the participation rate is one-fourth, to exceed its appropriation limit until 1986 if the participation rate is one-half. The loans in this program are sufficiently attractive that a participation rate of one-half seems the more likely alternative. Therefore, it appears probable that the appropriation limit proposed in the bill will be too small to adequately fund the program in the early 1980's. For the remainder of this section, the discussion will concentrate on projected net costs with the participation rate equal to one-half, the proportion of limit borrowed equal to one.

TABLE 6

Forecasts of Costs, Returns, and Net Costs of
The Tuition Advance Fund Bill With Tuition Controls
(in Millions of Dollars)

Participation Rate = ¼
Proportion of Limit Borrowed = ½

	Maximum Appro-priation	Proportion Of Limit At Which Programs Breaks Even	Costs From Students At Public Colleges	Costs From Students At Private Colleges	Total Costs	Returns	Net Costs
1980	4,500	0.000	948	575	1,524	0	1,524
1981	4,814	0.039	1,038	612	1,650	128	1,522
1982	5,214	0.079	1,147	658	1,805	287	1,518
1983	5,631	0.121	1,252	702	1,954	471	1,482
1984	6,017	0.171	1,337	734	2,071	706	1,365
1985	6,473	0.229	1,426	766	2,192	1,006	1,186
1986	7,100	0.288	1,543	815	2,358	1,357	1,001
1987	7,761	0.334	1,665	866	2,531	1,691	840
1988	8,312	0.404	1,758	910	2,668	2,158	510
1989	8,879	0.484	1,850	954	2,804	2,712	92
1990	9,533	0.562	1,957	1,004	2,961	3,330	-369

TABLE 6
(Cont)

Participation Rate = ¼
Proportion of Limit Borrowed = 1

	Costs From Students At Public Colleges	Costs From Students At Private Colleges	Total Costs	Returns	Net Costs
1980	1,897	1,150	3,047	0	3,047
1981	2,076	1,225	3,301	128	3,172
1982	2,293	1,316	3,609	287	3,323
1983	2,504	1,403	3,907	471	3,436
1984	2,675	1,467	4,142	706	3,436
1985	2,852	1,533	4,384	1,006	3,379
1986	3,086	1,631	4,716	1,357	3,359
1987	3,331	1,732	5,062	1,691	3,372
1988	3,515	1,820	5,336	2,158	3,177
1989	3,700	1,909	5,608	2,712	2,896
1990	3,915	2,007	5,922	3,330	2,592

TABLE 6
(Cont)

Participation Rate = ½
Proportion of Limit Borrowed = ½

	Costs From Students At Public Colleges	Costs From Students At Private Colleges	Total Costs	Returns	Net Costs
1980	1,897	1,150	3,047	0	3,047
1981	2,076	1,225	3,301	257	3,044
1982	2,293	1,316	3,609	573	3,036
1983	2,504	1,403	3,907	942	2,965
1984	2,675	1,467	4,142	1,413	2,730
1985	2,852	1,533	4,384	2,012	2,373
1986	3,086	1,631	4,716	2,715	2,001
1987	3,331	1,732	5,062	3,382	1,681
1988	3,515	1,820	5,336	4,316	1,019
1989	3,700	1,909	5,608	5,424	184
1990	3,915	2,007	5,922	6,659	-737

TABLE 6
(Cont)

Participation Rate = ½
Proportion of Limit Borrowed = 1

	Costs From Students At Public Colleges	Costs From Students At Private Colleges	Total Costs	Returns	Net Costs
1980	3,793	2,301	6,094	0	6,094
1981	4,152	2,450	6,602	257	6,345
1982	4,587	2,632	7,219	573	6,646
1983	5,007	2,807	7,814	942	6,872
1984	5,350	2,935	8,285	1,413	6,872
1985	5,703	3,066	8,769	2,012	6,757
1986	6,171	3,261	9,432	2,715	6,718
1987	6,662	3,463	10,125	3,382	6,743
1988	7,031	3,640	10,671	4,316	6,355
1989	7,400	3,817	11,217	5,424	5,793
1990	7,830	4,014	11,844	6,659	5,185

TABLE 6
(Cont)

Participation Rate = 1
Proportion of Limit Borrowed = 1

	Costs From Students At Public Colleges	Costs From Students At Private Colleges	Total Costs	Returns	Net Costs
1980	7,587	4,601	12,188	0	12,188
1981	8,304	4,899	13,203	514	12,689
1982	9,173	5,264	14,438	1,146	13,291
1983	10,014	5,614	15,628	1,885	13,743
1984	10,700	5,870	16,569	2,826	13,744
1985	11,407	6,131	17,538	4,023	13,515
1986	12,342	6,523	18,865	5,430	13,435
1987	13,324	6,926	20,250	6,763	13,487
1988	14,062	7,280	21,342	8,633	12,709
1989	14,799	7,634	22,434	10,848	11,585
1990	15,659	8,028	23,687	13,318	10,369

A discussion of possible biases in these results is in order. The projected net costs of the program are biased downward because:

1. Borrowers will probably self-select on low expected incomes and high college costs, implying that projected costs are too low, projected returns too high.

2. Some borrowers will retire their loans prior to 1990, implying that projected returns in later years are too large.

3. If the program is successful, it may make college more attractive to some new students, leading to increased enrollments. Naturally, the participation rate of persons induced to attend college by the availability of loans will be nearly one. This, therefore, leads to a large possible downward bias in estimated net program costs. This bias is unavoidable but that does not diminish its potential effect on the program.

Conversely, projected net costs of the program are biased upward because:

1. Returns are biased downward by the assumption that no program participant marries. This problem will have its effects, if at all, in the later years when returns are relatively large.

2. Inclusion of ineligible part-time students attending less than half time in the estimates of costs and returns will tend to bias both the projected costs and the projected returns upward. This problem will have no obvious effect on the projected number of years until the program breaks even, but it will tend to bias projected net costs upward in the early years. For instance, if all students attended college either three-fourths or one-fourth time, three-fourths of the difference between full-time and full-time-equivalent enrollment would be due to students who are eligible for the program. In 1980, when returns are zero, this would imply net costs of approximately 95% of the projected amount or about $5.8 billion. Any bias in net costs due to this problem will diminish as returns grow.

The high effective interest rates shown in Table 5 for one-year loans may lead juniors and seniors to shun the program in its first two years. This would reduce costs by two-thirds in 1980, one-third in 1981, and returns for 1981 would fall to zero. Then, as the third class of sophomores enrolled, costs would rise to their projected 1982 level but returns would be smaller. The net effect of this reaction by upperclassmen, then, would be to reduce the deficits in the first two years of the program and raise them thereafter. In fact, unwary observers might be caught off guard by the large increase in the deficit in 1982.

It is, of course, impossible to determine the net effect of the listed biases. Since there are effects pushing the projected figures in both directions, it seems appropriate to treat the reported values as approximations to the true values with no clear bias in either direction.

It is a simple matter for the interested reader to construct his/her own net cost estimate assuming a different participation rate or proportion of limit borrowed. All net costs are proportional to the participation rate and, while the effect of a different proportion of the limits borrowed is more complex, all the necessary data are in the tables. The reader is cautioned against simple extrapolation of returns

beyond 1990, since they are calculated assuming that no loans are fully repaid by 1990. After 1990, the rate of growth of returns will slow as new persons entering payment status are partly offset by persons leaving that status after completing payment of their loans. Similarily, the time until the program breaks even with all participants borrowing as much as they can will be longer than that calculated by simply extrapolating the second column in Table 5 until it reaches one.

Table 7 contains estimates of program costs, returns, and net costs with no tuition controls. For this table, loan limits are replaced by tuition plus a CPI-indexed $1,000 for public colleges, $900 for private colleges. Deficits are larger and grow faster in this formulation (e.g., the projected nominal deficit in 1990 with the participation rate equal one-half and the proportion of limit borrowed equal one is $6.4 billion in Table 7 versus $5.2 billion in Table 6). Further, since incomes and college costs both increase with wage rates, there is no a priori reason for a program without tuition controls to ever break even. The projected net costs presented in this table may be more accurate than those in Table 6 because, in the absence of substantial technological change in the classroom, it will be difficult for the federal government to maintain CPI-based cost controls on tuition.

One proposed alternative to indexing by the CPI is indexing by a regional index of college costs. Results under this form of indexing would probably be close to those in Table 7. Colleges are non-profit, so the projected increases in their tuition rates presumably reflect expected increases in their costs. Tying tuition to a regional wage index would lead to a similar result.

TABLE 7

Forecasts of Costs, Returns, and Net Costs of
The Tuition Advance Fund Bill With No Tuition Controls

Participation Rate = ¼
Proportion of Limit Borrowed = ½

	Appro-priation	Proportion Of Limit At Which Programs Breaks Even	Costs From Students At Public Colleges	Costs From Students At Private Colleges	Total Costs	Returns	Net Costs
1980	4,500	0.000	948	575	1,524	0	1,524
1981	4,814	0.039	1,046	622	1,668	128	1,539
1982	5,214	0.078	1,164	679	1,842	287	1,556
1983	5,631	0.117	1,280	735	2,014	471	1,543
1984	6,017	0.164	1,377	780	2,157	706	1,451
1985	6,473	0.218	1,479	826	2,305	1,006	1,300
1986	7,100	0.271	1,612	892	2,504	1,357	1,146
1987	7,761	0.312	1,752	961	2,713	1,691	1,022
1988	8,312	0.374	1,863	1,024	2,886	2,158	728
1989	8,879	0.443	1,974	1,088	3,063	2,712	351
1990	9,533	0.510	2,104	1,160	3,264	3,330	-66

TABLE 7
(Cont)

Participation Rate = ¼
Proportion of Limit Borrowed = 1

	Costs From Students At Public Colleges	Costs From Students At Private Colleges	Total Costs	Returns	Net Costs
1980	1,897	1,150	3,047	0	3,047
1981	2,091	1,244	3,336	128	3,207
1982	2,328	1,357	3,685	287	3,398
1983	2,560	1,469	4,209	471	3,558
1984	2,755	1,559	4,314	706	3,608
1985	2,958	1,653	4,611	1,006	3,605
1986	3,224	1,783	5,007	1,357	3,650
1987	3,505	1,921	5,426	1,691	3,735
1988	3,725	2,047	5,773	2,158	3,614
1989	3,948	2,177	6,125	2,712	3,413
1990	4,207	2,320	6,527	3,330	3,197

TABLE 7
(Cont)

Participation Rate = ½
Proportion of Limit Borrowed = ½

	Costs From Students At Public Colleges	Costs From Students At Private Colleges	Total Costs	Returns	Net Costs
1980	1,897	1,150	3,047	0	3,047
1981	2,091	1,244	3,336	257	3,079
1982	2,328	1,357	3,685	573	3,111
1983	2,560	1,469	4,029	942	3,086
1984	2,755	1,559	4,314	1,413	2,901
1985	2,958	1,653	4,611	2,012	2,599
1986	3,224	1,783	5,007	2,715	2,292
1987	3,505	1,921	5,426	3,382	2,044
1988	3,725	2,047	5,773	4,316	1,456
1989	3,948	2,177	6,125	5,424	701
1990	4,207	2,320	6,527	6,659	-132

TABLE 7
(Cont)

Participation Rate = ½
Proportion of Limit Borrowed = 1

	Costs From Students At Public Colleges	Costs From Students At Private Colleges	Total Costs	Returns	Net Costs
1980	3,793	2,301	6,094	0	6,094
1981	4,183	2,488	6,671	257	6,414
1982	4,655	2,714	7,369	573	6,796
1983	5,119	2,938	8,058	942	7,115
1984	5,510	3,119	8,628	1,413	7,215
1985	5,916	3,306	9,222	2,012	7,210
1986	6,447	3,567	10,014	2,715	7,300
1987	7,010	3,842	10,852	3,382	7,470
1988	7,451	4,095	11,545	4,316	7,229
1989	7,897	4,354	12,250	5,424	6,826
1990	8,414	4,640	13,054	6,659	6,395

TABLE 7
(Cont)

Participation Rate = 1
Proportion of Limit Borrowed = 1

	Costs From Students At Public Colleges	Costs From Students At Private Colleges	Total Costs	Returns	Net Costs
1980	7,587	4,601	12,188	0	12,188
1981	8,366	4,976	13,342	514	12,828
1982	9,310	5,428	14,738	1,146	13,592
1983	10,239	5,877	16,116	1,885	14,231
1984	11,019	6,237	17,256	2,826	14,431
1985	11,832	6,611	18,444	4,023	14,420
1986	12,895	7,134	20,029	5,430	14,599
1987	14,020	7,684	21,704	6,763	14,941
1988	14,901	8,189	23,091	8,633	14,458
1989	15,794	8,707	24,501	10,848	13,652
1990	16,828	9,280	26,108	13,318	12,790

28

V. CONCLUSION

The Tuition Advance Fund bill is analyzed in this study from a theoretical economic perspective and from a fiscal perspective.

The bill proposes to collect loan payments as income taxes and to make the amount due dependent on the income of both the borrower and his or her spouse. These are useful innovations.

An aspect of the program that is less attractive is its formula for computing repayments — participants pay 2% of their income if income exceeds $5,000 and their total repayments are at most 150% of the original loan. As a result, persons with low incomes or large loans pay much lower rates of interest than others. This difference could encourage participation in the program to be weighted toward those with low incomes or high college costs. It could lead participants to earn lower incomes or attend higher cost colleges, and it could even cause the charges in colleges to rise more rapidly than they would in the absence of the program.

The bill's reaction to the latter possibility is to impose controls on tuition and enrollment. These controls might be unworkable, and they would surely tend to disrupt the system of higher education. Perhaps a more sensible procedure would be to adjust the payment schedule to reduce differences in the rates paid by students with different size loans.

The forecasts of program costs in Section IV indicate that the program as currently proposed would probably cost more than the proposed appropriation limit of $4.5 billion adjusted for inflation. Assuming that half of the eligible students participate and that each participant borrows as much as possible, program costs are projected to be $6.1 billion in 1980 — $2.3 billion to private college students, $3.8 billion to public college students. These costs are projected under a number of strong assumptions, though there is no obvious net bias either up or down.

The drafters of the bill clearly expect the program to eventually pay its own way. This study generally supports that view, although the amount of time this takes is seen to be very dependent on how large a percentage of the limit is actually borrowed by each program participant. If participants borrow only half the limit, the program is projected to become self-supporting in 1990. On the other hand, if they borrow as much as possible the break-even year is pushed out beyond the period of analysis, perhaps even beyond the year 2000.

The progression to self-sufficiency is particularly slow if the bill's proposal to tie tuition increases to the increase in the Consumer Price Index proves unworkable. The scope for technological change in instruction is limited, so the instruction costs of colleges can be expected to rise faster than costs in industries with more room for productivity change. It is difficult to see how tuition can be made to rise at the same rate as other prices if instruction costs rise faster. Without the tuition controls, the projected real deficit for the program falls until 1990 but need not continue to fall thereafter. Therefore, without the controls the program might never become self supporting.

The contracting letter promised a study with the following three parts

1. A brief review of the economic implications of the bill. This was presented as Section II.
2. A forecast to 1990 of the distribution of income for individuals who have attended two or more years of college. Table 2 contained this forecast.
3. A forecast of the actuarial return of the Tuition Advance Fund bill and a summary of the methodology used to prepare the forecast. These were, respectively, Tables 5 and 6 and Section IV.

In addition to the materials called for in the contract, DRI also projected mean incomes of men and women to 2010 and used these values to estimate the effective interest rates paid by various classes of borrowers.

APPENDIX

This appendix presents projections of mean incomes and the price index from 1990 to 2010 that were used in Table 5. Methods used to calculate the projected values are also detailed.

Prices were projected by applying a seven-percent yearly increase after 1990, the last year in the DRI TRENDLONG forecast. Mean incomes of men 25-34, men 35-44, and women 35-44 were projected to grow at 11% per year, while incomes of women 25-34 were projected out at a 10% growth rate. These growth rates closely paralleled DRI's forecasts in the late 1980's. Growth rates of mean incomes and the price index imply roughly a 3% growth rate in real incomes of women 25-34, 4% for the other groups.

The mean income series for men and women presented in Table 8 were then constructed by using values for 25-34 year old individuals until 1992, values for 35-44 year old individuals from 1993 to 2010. This change in age groups explains the sharp increase in projected mean incomes for both sexes in 1993.

The projections presented here are accurate only if the assumed rates of growth in fact occur. Therefore, these projections are more properly thought of as benchmarks with continued growth than as forecasts.

TABLE 8

Projections of Mean Incomes of
Males and Females 1990 to 2020

		Men		Women	
	Price Index (1980=100)	Mean Income ($)	Mean Real Income (1980 $)	Mean Income ($)	Mean Real Income (1980 $)
1990	212	55,975	26,422	27,693	13,072
1991	227	62,133	27,410	30,463	13,439
1992	243	68,967	28,435	33,509	13,816
1993	260	135,283	52,127	42,592	16,412
1994	278	150,164	54,076	47,277	17,025
1995	297	166,682	56,097	52,478	17,662
1996	318	185,017	58,195	58,250	18,322
1997	340	205,369	60,370	64,658	19,007
1998	364	227,960	62,627	71,770	19,717
1999	389	253,035	64,968	79,665	20,454
2000	417	280,869	67,397	88,428	21,219
2001	446	311,765	69,916	98,155	22,012
2002	477	346,059	72,530	108,952	22,835
2003	511	384,125	75,241	120,936	23,689
2004	546	426,379	78,054	134,240	24,574
2005	584	473,281	80,972	149,006	25,493
2006	625	525,342	83,999	165,396	26,446
2007	669	583,129	87,139	183,590	27,435
2008	716	647,274	90,397	203,785	28,460
2009	766	718,474	93,776	226,201	29,524
2010	820	797,506	97,282	251,084	30,628

Responses to Questions and Comments Concerning DRI's Analysis of the Tuition Advance Fund Bill

November 2, 1978

The report "An Analysis of the Tuition Advance Fund Bill" was presented and discussed at a meeting of the AMICUS Executive Committee on October 5, 1978. This follow-up presents responses to questions raised both during the meeting and in several calls since then.

Ralph Sorenson, President of Babson College, said he understood the need for control of the program's costs but found the tuition and enrollment controls objectionable. He suggested that the program be modified to control students' loan entitlements rather than the tuition charges they face.

He proposed a simple annual entitlement of $1,800 for students at public colleges and $3,600 for students at private colleges (both indexed for inflation). Since public college tuitions for non-residents are much higher than for residents, he proposed that non-resident students at public colleges be entitled to loans under a modification of the HR12268 program: tuition plus $1,000 but never more than the private school amount.

Table 9 presents cost estimates for President Sorenson's proposal (indexed by the CPI) with 50% participation and 100% of the limit borrowed under the assumption that all students in the second or higher year of public colleges are residents.*

In 1980, the average private college loan would be $610 less in Table 9 than in Table 4, while the average public college loan would be $90 more (for the many more public college students). The forecast net cost of this program is $6,025 million in 1980, $69 million less than under HR12268. The share of costs going to students at private colleges in 1980 is 34%, down from 37% for HR12268. Returns are unchanged from Table 6 and all values grow like those in Table 6 because the CPI was used as an index in both tables.

President Sorenson's proposal appears to overcome some of the problems in the Tuition Advance Fund Bill. In the bill, the $5,000 overall limit is effective only for high-cost private schools; here limits are effective for everyone. The removal of the tie between tuition and loan entitlement lessens the incentive for colleges to raise tuition in response to the loans and allows cost controls without price controls. President Sorenson's program would also be very simple to administer. On the negative side, it fails to take into account regional differences in costs, although these could be built in. It also forces students to bear all the costs of increased quality within a type of school. Therefore, it might hurt the higher quality public schools if a large number of students seeking to increase the quality of school they attend decide to move from public to private colleges rather than upgrading within the public sector.

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* This assumption reflects lack of data on residency of second or higher year college students and the tuition they pay. This assumption was also implicit in the earlier report, since the forecast public college tuition rates were those for residents only. Since one year is sufficient to establish residency in most states (e.g., the freshman year during which students are ineligible for loans) the assumption is likely to be close to reality.

Addendum to "An Analysis of the Tuition Advance Fund Bill" by Data Resources, Inc.

Table 9

Forecasts of Loan Amounts, Costs, and Net Costs with Participation Rate = ½, Proportion of Limit Borrowed = 1 under President Sorenson's Proposal

	Average Loan Amount for Students at Public Colleges ($)	Average Loan Amount for Students at Private Colleges ($)	Costs of Students at Public Colleges ($ million)	Costs of Students at Private Colleges ($ million)	Total Costs ($ million)	Net Costs ($ million)
1980	1800	3600	4104	2010	6025	6025
1981	1925	3851	4394	2140	6534	6277
1982	2086	4171	4854	2300	7154	6581
1983	2252	4505	5299	2453	7751	6809
1984	2407	4813	5661	2564	8226	6813
1985	2589	5178	6036	2679	8714	6703
1986	2840	5680	6531	2850	9380	6665
1987	3104	6209	7050	3026	10076	6694
1988	3325	6649	7440	3181	10621	6305
1989	3552	7103	7831	3335	11166	5742
1990	3813	7627	8286	3507	11793	5134

The simplicity of President Sorenson's proposal makes modifications very easy to evaluate. Indexing to higher education costs or wages instead of the CPI would cause all values to grow like those in Table 7, rather than like those in Tables 6 and 9. Different limits are easily incorporated—e.g. $1,500 and $3,000 for public and private students respectively would cost $5,020 million in 1980. Different enrollment assumptions such as those discussed below, also have obvious effects on President Sorenson's proposal; in its basic form it always costs slightly less than HR12268.

Representatives of Boston University had five comments. The comments are stated and discussed in turn.

1. Indexing of the appropriation should begin one year earlier, so that the 1980 value would be blown up by one year of inflation.

This does not accord with DRI's reading of the bill but it could approximate the final outcome of the legislative process. Under this idea, all appropriation limits would be increased by 6.3%—DRI's forecast of 1979 inflation—becoming $4,788 million in 1980, $10,133 million in 1990.

2. The appropriate index for tuition should be one that reflects actual costs, not the CPI.

All dollar values in the bill are indexed to the CPI, but the procedure may change. On the assumption that forecast tuition increases reflect cost increases, DRI can incorporate this suggestion by using "No Tuition Controls" values (like those in Table 7) in what follows.

3. The bill limits eligibility to degree-credit students attending at least one-half time, while DRI's enrollment figures also include "first-professional"

students (non-graduate professional students in areas like medicine, law, and dentistry) and students not seeking a degree.

The bill states that eligibility is limited to students who have not "successfully completed a program of undergraduate education" and are currently "enrolled in such a program" (p. 3 of HR12268). Table 10 presents three sets of enrollment statistics using alternative definitions of the eligible population. The first set repeats those in Table 4. The second set removes first-professionals using a complicated process suggested by the B.U. representatives. The process involves assuming a) that the fraction of first-professional students enrolled in each type of school remains constant at the 1977 level and b) that the fractions of these students in public and private schools equal their 1977 fractions of graduates of first-professional schools.*

Table 10

Projected Full-Time-Equivalent Enrollments in Institutions of Higher Education under Alternative Definitions of Eligibility (thousands)

	Figures Used in Report			Subtracting First-Professional Students			Also Subtracting Non-Degree-Credit Students		
	Total	Private	Public	Total	Private	Public	Total	Private	Public
1980	8450	1592	6758	8240	1569	6671	6914	1528	5386
1981	8599	1684	6915	8388	1562	6826	6992	1521	5471
1982	8723	1671	7052	8510	1549	6962	7045	1508	5538
1983	8779	1650	7129	8567	1529	7038	7047	1488	5559
1984	8743	1614	7128	8533	1496	7037	6978	1455	5523
1985	8632	1568	7064	8426	1452	6974	6850	1411	5439
1986	8489	1520	6968	8287	1408	6879	6701	1367	5334
1987	8358	1477	6881	8161	1367	6794	6565	1326	5239
1988	8231	1449	6782	8037	1342	6695	6431	1301	5130
1989	8104	1423	6681	7913	1317	6596	6297	1276	5021
1990	7978	1394	6548	7790	1290	6500	6164	1249	4915

This adjustment is clearly appropriate, since the program is intended to serve undergraduates, but the resulting changes are quite small—a 7% decrease in private enrollment, a 1% fall in public enrollment.

Moving from the second set of figures to the third set, as advocated by the Boston University representatives, may not bring one closer to reality. This adjustment also removes full-time-equivalent enrollments of "students in occupational or general studies programs not chiefly creditable toward a bachelor's degree" (Table 9, Projections of Education Statistics to 1985-1986). These values include occasional students not "enrolled" in "a program of undergraduate education" together with these enrolled in vocational and non-academic programs (e.g. T.V. repair). There are no useful data that distinguish between eligible and ineligible students in this group, and it is DRI's estimate that most "non-degree-credit" students are eligible.

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* The necessary values came from 1976-1977 figures in Tables 91 and 111 of the Digest of Education Statistics 1977-1978

Addendum to "An Analysis of the Tuition Advance Fund Bill" by Data Resources, Inc.

Table 11 presents alternative estimates of costs and net costs with the most likely participation rate and proportion of limit borrowed under the three enrollment forecasts. DRI considers the second set of figures, only 3.5% less than those in the first set in 1980, most likely to be correct. The third set of figures is much lower, but they surely delete some students that are eligible for the program. Further, since returns are figured as 2% of the includable income of all persons who have ever attended the second or higher year of college—full-or part-time, degree-credit or not—the third set also biases returns upward. The reader may want to make an adjustment in the second set of figures during the first few years of the program, since returns will be low in those years. Wholesale replacement of the second set by the third set, however, is almost surely inappropriate.*

Table 11

Forecasts of Costs and Net Costs with
Participation Rate = ½, Proportion of Limit Borrowed = 1,
No Tuition Controls, No Trust Fund

	From Table 7 of Report		Subtracting First-Professional Students		Also Subtracting Non-Degree-Credit Students	
	Cost	Net Cost	Cost	Net Cost	Cost	Net Cost
1980	6094	6094	5878	5878	5101	5101
1981	6671	6414	6436	6179	5556	5299
1982	7369	6796	7111	6538	6104	5531
1983	8058	7115	7777	6834	6642	5699
1984	8628	7215	8328	6915	7079	5666
1985	9222	7210	8903	6891	7531	5519
1986	10014	7300	9669	6954	8143	5428
1987	10852	7470	10478	7096	8737	5406
1988	11545	7229	11146	6830	9311	4995
1989	12250	6826	11826	6402	9839	4415
1990	13054	6395	12601	5942	10439	3780

4. The report ignores the trust fund aspect of the program and simply applies all receipts directly to costs.

The bill states that

(b)(1) There is hereby established in the Treasury a trust fund which shall be available, without fiscal year limitation, to the Commissioner for purposes of this part. There shall be deposited in such fund amounts appropriated pursuant to paragraph (2) and all amounts collected pursuant to section 5 of the Internal Revenue Service Code of 1954.

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* Notice that, if the third set of figures is used, it is clearly incorrect to also adjust for inclusion of ineligible part-time students, since most of them will be non-degree-credit.

(2) There is authorized to be appropriated, for each fiscal year . . . an amount sufficient to fulfill the purposes of section 452 of this Act, not to exceed $4,500,000,000 adjusted for inflation and ceasing . . . two fiscal years after the fiscal year . . . in which the income from the unused portion of such fund plus the amount collected pursuant to section 5 of such code . . . exceeds the amount necessary to fulfill the purposes of section 452 of this Act for such break-even year." (pp 2-3, emphasis added).

DRI's reading of this section is that no trust fund accumulations would occur in any year in which the demands on the program exceed the maximum allowable appropriation. Since this occured under most assumptions, DRI simply modelled a flow through with no trust fund accumulations. The B.U. representatives insist that the intent of the bill is that all moneys used to make loans be appropriated directly and that all repayments (but no excess appropriations) accumulate in the trust fund. Any failure of appropriations to meet demand, by their reading, would lead to unmet need without affecting the trust fund.

Table 12 presents figures under this reading of the bill given alternative enrollment projections. The "cost" columns are the same as in Table 11, but here they are also net costs. The "benchmark" columns serve only to keep track of movements toward the "break-even year." The size of the trust fund depends only on the assumed participation rate, so this column appears only once. The trust fund is assumed to be invested in one-year treasury bonds, so DRI's forecast of rates on these bonds is used to forecast interest earnings.

Table 12

Forecasts of Costs, Benchmarks, and Trust Fund Accumulations with Participation Rate = ¼, Proportion of Limit Borrowed = 1, No Tuition Controls, Trust Fund

	Trust Fund	Using Enrollment Figures from Report		Subtracting First-Professional Students		Also Subtracting Non-Degree-Credit Students	
		Cost	Benchmark	Cost	Benchmark	Cost	Benchmark
1980	0	6094	6094	5878	5878	5101	5101
1981	257	6671	6414	6436	6179	5556	5299
1982	849	7369	6777	7111	6519	6104	5513
1983	1850	8058	7056	7777	6776	6642	5640
1984	3389	8628	7090	8328	6790	7079	5540
1985	5630	9222	6981	8903	6662	7531	5290
1986	8721	10014	6923	9669	6578	8143	5052
1987	12675	10852	6898	10478	6524	8787	4833
1988	17817	11545	6403	11146	6004	9311	4169
1989	24402	12250	5665	11826	5241	9839	3254
1990	32653	13054	4803	12601	4351	10439	2189

Adding to the trust fund in this way removes the diminution of net costs that comes from returns, so forecast costs rise continuously (although large enough enrollment declines could conceivably offset inflation and make costs fall) until they decrease to zero two years after the program breaks even. The program would almost surely break even eventually in this form because the trust fund continues to grow, and the "break-even year" will come somewhat sooner than without the trust fund.

Costs under this reading of the bill are increased substantially during 1980-1990 time span. Using the second set of values, total appropriations summed from 1980 to 1990 are $100.2 billion in Table 12 compared to $72.5 billion in Table 11 (with the difference drawing interest in the trust fund). Further, whereas net costs in Table 11 fall below B.U.'s revised appropriation limit by 1986, costs in Table 12 always exceed the maximum allowable appropriation.

5. The National Center for Education Statistics projections of enrollments are probably too high as indicated by the overstimate of the 1977 value for which history is now available. *

This point is granted, although the B.U. representatives agreed with DRI that the NCES figures are probably the most neutral available. If the pattern of overestimating returns is true for the 1980's, it will lead to overestimates of the costs of the program.

Summary

President Sorenson's proposal appears to be a workable alternative to HR12268, slightly less costly and somewhat easier to administer, though with less flexibility.

The B.U. query about enrollments led to generation of additional results, although with little change in the expected costs of the program. Modeling the trust fund as B.U. requested markedly changes the structure of the program, as all costs are borne by appropriation and returns go into a trust fund. The total amount of money in the program is not affected, but dollars pass from the Congress to the trust fund where they are less accessible, leading to higher near-term appropriations and lower appropriations later on.

Finally, it should be pointed out that HR12268 is poorly drafted. Between its failure to index the threshold and the "other education costs" allowance (which the B.U. representatives term an "oversight") and the ambiguities detailed in this follow-up, the bill is in need of substantial clarification.

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* NCES projected enrollments to rise from 11.2 million to 11.7 million between 1976 and 1977; actual enrollments fell to 11.0 million. This does not necessarily mean that enrollments will always fall but it does counsel caution.